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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,762	10/24/2003	Toni A. Armstrong	38-21(10621)C	8955

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EXAMINER	
HWU, JUNE	

ART UNIT	PAPER NUMBER
1661	

DATE MAILED: 12/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,762	ARMSTRONG ET AL.	
	Examiner	Art Unit	
	June Hwu	1661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-8,10-14,17-22,26-33,35-41,43-45,49-52 and 54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-8,10-14,17-22,26-33,35-41,43-45,49-52 and 54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment to the claims and arguments filed October 13, 2006 is acknowledged and entered.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in the prior Office action.

3. The objection to the specification with regard to the term "PARAFILM M" is withdrawn due to Applicants' amendment of the specification.

4. The rejection of claims 19 and 49 under 35 USC 112, second paragraph is withdrawn due to Applicants' amendment of the claims.

5. The rejection of claims 1, 5-6, 8, 10-12, 14, 17, 18, 39-41, 44, and 50-52 under 35 USC 103(a) as being unpatentable over Smith et al (In Vitro, vol. 13, no. 5, 1977, pp. 329-334) in view of Adkins et al (Journal of Experimental Botany, vol. 44, no. 269, 1983, pp. 1829-1835) is withdrawn in favor of the new rejections below.

6. The rejection of claims 7, 13, 20-22, 26-28, 31-33, 36-38 and 45 under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of Adkins et al as applied to claims 1, 5-6, 8, 10-12, 14, 17-19, 39-41, 44 and 50-52 above, and further in view of Umbeck (U.S. Patent No. 5,004,863) is withdrawn in favor of the new rejections below.

7. The rejection of claims 29, 30 and 35 under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of Adkins et al, and further in view of Umbeck as applied to claims 28 and 31 above, and further in view of Dodds et al (Experiments in Plant Tissue Culture, 2nd ed. 1985) is withdrawn in favor of the new rejections below.

8. The rejection of claims 43 and 54 under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of Adkins et al as applied to claims 39 and 50 above, and further in view of Dodds et al is withdrawn in favor of the new rejections below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

9. Claim 8 is rejected under 35 U.S.C. 102(a) as being anticipated by Kumar et al (Plant Cell Report (Nov. 1998) 18: 59-63.

The claim is drawn to a method of inducing regenerable non-embryogenic cotton callus comprising culturing the callus tissue in media containing antioxidant such as activated charcoal.

Kumar et al disclose a method of regenerating cotton (*Gossypium hirsutum*) by culturing hypocotyls explants (p. 60, left col. lines 9-10) in an induction media containing 0.15% (w/v) activated charcoal (p. 60, right col. last paragraph and Table 2).

10. Claims 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al (In Vitro, vol. 13, no. 5, 1977, pp. 329-334). The rejection is repeated for the reasons of record as set forth in the Office action mailed April 13, 2006, as applied to claims 1, 5, 6, 8 and 10-12.

The claims are drawn to a method of culturing cotton tissue in media under dark lighting condition (0 μEinsteins $m^{-2}sec^{-1}$).

Smith et al discloses a method of callus initiation of *Gossypium* (cotton) by culturing cotton callus tissues derived from hypocotyls and cotyledon in a dark incubator or limited light condition (1000 to 2000 lux) (p. 330, right col. 2nd full paragraph). Moreover, 0.6% of Difco

Bactoagar was used in the media, which is a form of support matrix (p. 330, right col., 1st full paragraph). All of the experiments were sealed with plastic Kaputs (p. 330, left col., last paragraph).

Applicants' arguments filed October 13, 2006 have been fully considered but they are not persuasive.

Applicants argue that Smith et al teach callus initiation of plant cells from *Gossypium arboreum* and not of *Gossypium hirsutum* (p. 10 of reply).

This is not found persuasive because the claims are not limited to *Gossypium hirsutum* but to any cotton callus tissue or embryogenic cotton tissue including *Gossypium arboreum*.

Applicants argue that Smith et al is not concerned with culturing regenerable embryogenic or non-embryogenic cotton cells.

In response to applicants' arguments, the recitation "culturing regenerable non-embryogenic cotton callus tissue or embryogenic cotton tissue" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicants argue that the Smith et al disclosed that low light condition yielded poorer growth than high light condition and that the data from cell growth under dark condition was not shown (p. 10 of reply).

This is not found persuasive because there was still some growth found under dark condition even though low light conditions were better that dark conditions.

Applicants argue that isoascorbic acid and ascorbic acid are not interchangeable as plant cell culture ingredients.

The rejection is withdrawn over claims 8 and 10-12.

11. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hirimburegama et al (Journal of the National Science Council of Sri Lanka, 22(4), 1994, pp.305-315).

The claim is drawn to a method of culturing cotton tissue in media under dark lighting condition (0 μEinsteins $m^{-2}sec^{-1}$).

Hirimburegama et al discloses a method of culturing anther, and leaf tissues of cotton cultivar Coker 417 for callus induction in complete darkness (p. 305, last paragraph - p. 306, 2nd paragraph).

Applicants' arguments filed October 13, 2006 have been fully considered but they are not persuasive.

Applicants argue that Hirimburegama et al do not describe regenerable cell culture of *Gossypium hirsutum* (p. 12 of reply).

In response to applicants' arguments, the recitation "culturing regenerable non-embryogenic cotton callus tissue or embryogenic cotton tissue" has not been given patentable weight because the recitation occurs in the preamble.

12. Claims 8, 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Davis et al (In Vitro, vol. 9, no. 5, 1974).

The claims are drawn to a method of inducing regenerable non-embryogenic cotton callus by culturing the cotton callus tissue in media containing an antioxidant such as ascorbic acid.

Davis et al disclose a method of culturing regenerable cotton (*Gossypium hirsutum*) leaf explant (p. 395, left col., 2nd paragraph) in media containing 5 mg/l of ascorbic acid (p. 395, right col., lines 9-10).

13. Claims 28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Firoozabady et al (Plant Molecular Biology 10: 105-116, 1987).

The claims are drawn to a method of culturing transgenic embyogenic cotton tissue wherein the culture media contains a support matrix, for example filter paper.

Firoozabady et al disclose a method of cotton (*Gossypium hirsutum*) transformation comprising placing cotyledon tissue on filter paper to induce callus formation (p. 107, right col. 2nd full paragraph). After cocultivation and subculturing, the cotton tissues formed into plantlets (p. 108, left col., 1st paragraph).

14. Claims 36-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Rangan (U.S. Patent No. 5,244,802).

The claims are drawn to a method of culturing transgenic embryogenic cotton tissue in media containing an amino acid hydrolysate supplement.

Rangan discloses a method of cotton regeneration wherein the cotton cotyledons were cut into segments (col. 12, lines 5-6) and cultured in media until callus formed then the callus was transferred to suspension medium for further regeneration (col. 13, lines 5-7). After three to four subcultures on Beasley & Ting medium containing 500 mg/l casein hydrolysate (amino acid hydrolysate), the embryogenic callus produced embryos (col. 13, lines 66-68). These embryos eventually developed into plants (col. 14, lines 1-3). The seedling explants can also be transformed (col. 10, line 36 and examples 9-14).

Claim Rejections - 35 USC § 103

15. Claims 1, 5-6, 8, 10-12, 14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of Davis et al (*In Vitro* vol. 9, no. 6, 1974, pp. 395-398) and further in view of Chi et al (Plant Cell Reports (1990) 9: 195-198).

The claims are drawn to a method of culturing non-embryogenic cotton callus tissue derived from hypocotyl, cotyledon and leaf in an embryo induction media containing antioxidant (ascorbic acid) and ethylene inhibitor (aminoethoxyvinylglycine).

The teachings of Smith et al are discussed above.

Smith et al do not teach the method of initiating cotton callus tissue wherein the media contains ascorbic acid and aminoethoxyvinylglycine (ethylene inhibitor).

The teachings of Davis et al are discussed above.

Chi et al teach that aminoethoxyvinylglycine (AVG) enhanced shoot regeneration from cotyledons of *Brassica*, a dicot. Cotyledons and hypocotyls of *Brassica* were excised and cultured on medium containing 20 μM AVG (p. 195 right col. last paragraph to p. 196, left col., line 4 and Table 1). Chi et al noted that the cotyledons were more regenerative than hypocotyls (p. 196, right col. 1st full paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the method of cotton initiation and growth as taught by Smith, and to modify that method by the addition of ascorbic acid as taught by Davis and the addition of AVG as taught by Chi. One of ordinary skill in the art would have been motivated to combine Smith and Davis because Davis had noted that cotton callus showed good growth when ascorbic acid was added to the medium (p. 397, left col., first paragraph). One of ordinary skill in the art would have been motivated to combine Smith, Davis and Chi because Chi taught that dicot plants were able to

regenerate with the addition of AVG (p. 198, left col., 1st full paragraph). Moreover, one of ordinary skill in the art at the time the invention was made would use the method of culturing cotton tissue grown under dark lighting condition as taught by Smith and to modify that method by the addition of ascorbic acid which showed good growth in cotton callus (p. 397, left col. 1st full paragraph) as taught by Davis and adding AVG which enhanced shoot regeneration as taught by Chi as an obvious decision choice. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

16. Claims 7, 13, 19-22, 26-27, 31-33 and 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of Davis et al, and Chi et al as applied to claims 1, 5-6, 8, 10-12, 14, 17, and 18 above, and further in view of Firoozabady et al.

The claims are drawn to culturing transgenic embryogenic cotton callus tissue in media containing antioxidant and ethylene inhibitor under dark lighting condition wherein a filter paper is the support matrix.

The teachings of Smith, Davis, and Chi are discussed above.

Smith, Davis, and Chi do not teach the use of filter paper as a support matrix in culturing transgenic embryogenic cotton callus tissue.

The teachings of Firoozabady are discussed above.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the teachings of Smith, Davis, and Chi as discussed above, and to modifying that method by utilizing filter paper as a support matrix as taught by Firoozabady. One of ordinary skill in the art would have been motivated to do so given the ease of removing the filter paper without injuring the tissue cells and to reduce the amount of bacterial growth (p. 107, 2nd full paragraph). Moreover, one of ordinary skill in the art at the time the invention was

made would use the method of culturing cotton callus tissue grown under dark lighting condition as taught by Smith and to modify that method by the addition of ascorbic acid as taught by Davis, the addition of AVG as taught by Chi and the use of filter paper in culturing transgenic embryogenic cotton tissue as taught by Firoozabady as an obvious decision choice to promote cotton regeneration. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

17. Claims 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of Davis et al and Chi et al as applied to claims 1, 5-6, 8, 10-12, 14, 17 and 18 above, and further in view of Rangan (U.S. Patent No. 5,244,802).

The claims are drawn to a method of culturing cotton callus tissue and transformed cotton callus tissue in media containing antioxidant and ethylene inhibitor under dark lighting condition to produce embryogenic cotton tissue wherein the culture media contain a support matrix and amino acid hydrolysate supplement.

The teachings of Smith et al, Davis et al and Chi et al are discussed above.

Smith et al, Davis et al and Chi et al do not teach the addition of amino acid hydrolysate, for example, casein hydrolysate.

The teachings of Rangan are discussed above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the method of cotton initiation and growth under dark lighting condition as taught by Smith, and to modify that method by the addition of ascorbic acid as taught by Davis, and the addition of AVG as taught by Chi, and finally adding casein hydrolysate to the medium as taught by Rangan. One of ordinary skill in the art would have been motivated to combine the methods of Smith, Davis, and Chi with the method of Rangan because casein hydrolsate may further

develop the somatic embryos into plantlets (col. 9, lines 19-29 and col. 10, lines 25-31). Moreover, one of ordinary skill in the art at the time the invention was made would use the method of culturing cotton callus tissue grown under dark lighting condition as taught by Smith and to modify that method by the addition of ascorbic acid as taught by Davis, the addition of AVG as taught by Chi, and the addition of amino acid hydrolysate to improved somatic embryos growth as taught by Rangan as an obvious decision choice. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

18. Claims 39-41, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith in view of Davis, Chi and Rangan as applied to claims 36-38 above, and further in view of Firoozabady.

The claims are drawn to culturing cotton callus tissue in media comprising of antioxidant, ethylene inhibitor under dark light condition and culturing the embryogenic cotton tissue in media containing amino hydrolysate supplement, wherein the media contains a support matrix.

The teachings of Smith, Davis, Chi and Rangan are discussed above.

Smith, Davis, Chi and Rangan do not teach that callus culture media contain filter paper as the support matrix.

The teachings of Firoozabady are discussed above.

It would have been obvious to one of ordinary skill in the art to use the method of cotton plant regeneration as taught by Smith, Davis, Chi and Rangan as stated above, and to modify that method by including in the cotton callus culture media a filter paper as the support matrix given the advantage of reducing bacterial growth from the media as taught by Firoozabady. One would have been motivated to do so, given the success rate and ease of removing the filter

paper without altering the tissue cells. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

19. Claims 45 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith in view of Gould et al (Plant Cell Reports (1991) 10: 12-16).

The claims are drawn to a method of culturing transgenic embryogenic cotton tissue under dark lighting condition and wrapped with a laboratory film.

The teachings of Smith are discussed above.

Smith does not teach that the method of culturing transgenic cotton tissue in media wrapped with a laboratory film.

Gould et al teach that *Gossypium* cultivar Coker 310 can be regenerated by shoot apex for plant transformation. Gould et al taught that the shoot apex culture was supplemented with citric acid or activated charcoal (p. 13, left col. last paragraph, p. 14 col. 4th paragraph and Table 2). Furthermore, the culture plates were sealed with PARAFILM (p. 13, left col. last paragraph).

It would have been obvious to one of ordinary skill in the art to use the method of culturing cotton callus tissue under dark lighting condition as taught by Smith and to modify that method by sealing the culture with PARAFILM as taught by Gould. One would have been motivated to do so, given that sealing the culture would prevent evaporation or contamination. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

JH 1/29/06 20. Claims 50-52 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith in view of Davis, Chi, Rangan and Firoozabady as applied to claims 39-41, 43 and 44 above, and further in view of Gould.

The claims are drawn to a method of culturing cotton callus tissue in media comprising of antioxidant, ethylene inhibitor under dark light condition or limited light condition, and culturing the embryogenic cotton tissue in media containing amino hydrolysate supplement, and a support matrix wrapped with a sealing material.

The teachings of Smith, Davis, Chi, Rangan and Firoozabady are discussed above.

Smith, Davis, Chi, Rangan and Firoozabady do not teach that the cotton callus culture media are wrapped with a sealing material.

The teachings of Gould are discussed above.

It would have been obvious to one of ordinary skill in the art to use the method of cotton plant regeneration as taught by Smith, Davis, Chi, Rangan and Firoozabady as stated above, and to modify that method by wrapping the cotton callus culture with a sealing material such as a laboratory film as taught by Gould given the advantage of reducing contamination in the media. One would have been motivated to do so, given the survival rate growing cotton tissue cells. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Conclusion

JH 1/29/06 20. No claims are allowed.

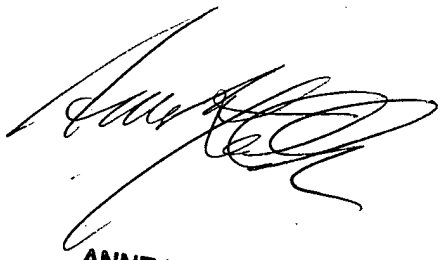
Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to June Hwu whose telephone number is (571) 272-0977. The Examiner can normally be reached Monday through Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Anne Marie Grunberg, can be reached on (571) 272-0975. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JH



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